

**Remarks**

Applicants thank the Examiner for carefully considering the subject application.

On April 29, 2004, Applicants' representative conducted a telephonic interview with the Examiner regarding the pending claims. During the interview, the claims were restricted into two different groups, system claims and method claims, which Applicants believe is based on MPEP §806.05(e) relating to a process and an apparatus for its practice. In other words, the method claims are directed toward generating information and carrying out a function to control the engine, while the system claims are directed to a vehicle having a fuel tank.

In accordance with the telephone restriction requirement, Applicants provisionally elect the method claims (1-15 and 33), without traverse. As such, Applicants have not responded substantively to the rejection of claims 16-32, as such claims are non-elected claims. Thus, this response is fully responsive to the Office Action in light of the telephone restrictions. If there are matters which still need to be addressed, Applicants respectfully request the Examiner to immediately provide a correction so that Applicants can provide a complete response as to all matters in the Office Action dated March 29, 2004.

**REJECTIONS UNDER 35 U.S.C. § 102.**

Turning now to claims 1-15 and 33, the Examiner has first rejected claims 5-8 and 33 under 35 U.S.C. § 102 in view of Lambert et al. (U.S. 2003/0213474). Applicants respectfully disagree.

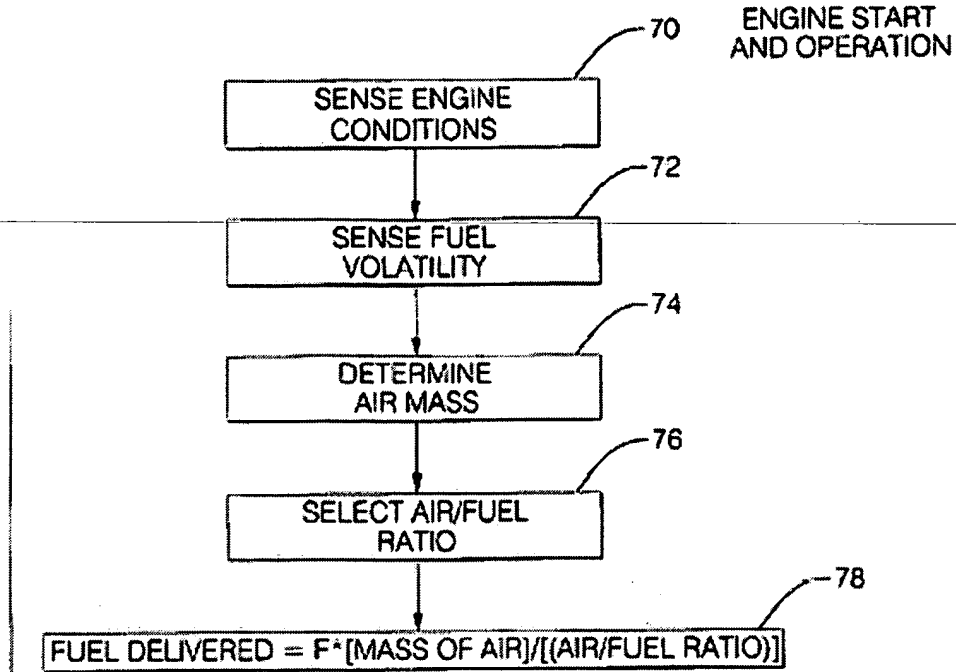
Claims 5 and 6

Claim 5 relates to adjusting the timing of injected fuel (earlier or later) that may provide for reduction in emission generation during the combustion process. See paragraph [0061]. Specifically, Claim 5 claims:

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A method for controlling a multi cylinder engine operated with fuels of varying volatility or viscosity, comprising:  
    providing a signal related to viscosity or volatility of the fuel, said signal being derived from alterations in a source of energy directed into the fuel;  
    providing the fuel to at least one of the cylinders at a timing related to a predetermined engine operation; and  
    adjusting said fuel timing to an earlier or later timing in relation to said signal.

As one example, Applicants can find nothing in Lambert et al. that shows adjusting timing of injecting fuel earlier or later in relation to a viscosity or volatility signal. Rather, as shown below by reproduced Figure 3, as well as the corresponding text of Lambert et al., the method controls the amount of fuel delivered to the engine based upon the desired air/fuel ratio, the fuel volatility, and the intake of air mass in step 78. Applicants can find no adjustment of timing earlier or later. This applies to claim 6 as well.



As another example, Applicants can find nothing in Lambert et al. that show providing a signal related to viscosity or volatility of the fuel, where the signal is derived from alterations in a source of energy directed into the fuel. In fact, the reference suggests that another type of sensor should be used. Specifically, Lambert et al. refers to Serial Number 10/062,581 (U.S. 20030140715, cited by the Examiner), which purportedly discloses an evaporative calorimetry type sensor.

Therefore, the applied reference fails to show or suggest all claimed features.

#### Claims 7 and 8

Claim 7 (which has been amended to correct a typographical error) relates to utilizing a fuel viscosity signal to generate a minimum air/fuel ratio for an engine. Specifically, Claim 7 claims:

A method for controlling a multi cylinder engine operated with fuels of varying volatility or viscosity, comprising:  
generating a signal related to fuel viscosity;  
inducting air into each of the cylinders;  
delivering fuel to each of the cylinders in relation to said inducted air and a desired air/fuel ratio;  
generating a minimum air/fuel ratio in relation to said viscosity indication; and  
preventing said delivered fuel from falling below a minimum amount corresponding to said minimum air/fuel ratio.

As one example Applicants can find nothing in Lambert et al. that shows using fuel viscosity. Rather, Lambert et al. repeatedly refers to fuel volatility. See, e.g., paragraphs [0009], [0010], etc. Nothing in Lambert et al. shows any link between fuel viscosity and volatility, and as such Lambert et al. does not anticipate claim 7. Since claim 8 depends from claim 7, it also is not anticipated by Lambert et al.

#### Claim 33

Claim 33 also relates to utilizing a fuel viscosity signal, although here it is used simply to adjust fuel injection. Specifically, Claim 33 claims:

A method for controlling a multi cylinder engine operated with fuels of varying volatility or viscosity, comprising:  
providing a signal related to viscosity based on a rate of change of an exhaust system sensor; and  
adjusting fuel injection in relation to said signal.

Again, as one example, Applicants can find nothing in Lambert et al. that shows a signal related to fuel viscosity. Rather,

Lambert et al. repeatedly refers to fuel volatility. Nothing in Lambert et al. shows any link between fuel viscosity and volatility, and as such, Lambert et al. does not anticipate claim 33.

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**REJECTIONS UNDER 35 U.S.C. § 103.**

The Examiner has rejected claims 1-15 and 33 under 35 U.S.C. § 103 in view of Kojima (5,233,959) and Wolf et al. (U.S. 6,304,021). Applicants respectfully disagree.

**Claims 1-4**

Claim 1 relates to adjusting the ignition timing based on a signal related to viscosity of the fuel, where the signal is derived from alteration in an acoustic wave cause by the fuel. Specifically, claim 1 claims:

A method for controlling a spark ignited engine operated with fuels of varying volatility or viscosity, comprising:  
    generating an acoustic wave in proximity to the fuel;  
    providing a signal related to viscosity or volatility of the fuel, said signal being derived from alterations in said acoustic wave caused by said fuel;  
    providing a base ignition timing signal to the engine for predetermined engine operation;  
    adjusting said base ignition timing signal in relation to said signal; and  
    adjusting a fuel injection amount based in relation to said signal.

Applicants first submit that the combination of Wolf et al. with Kojima is improper due to lack of motivation to make the combination. However, even assuming they are combined, as one example, Applicants can find no disclosure or suggestion of adjusting a fuel injection amount based on a signal derived from

alterations in an acoustic wave caused by the fuel. Rather, Kojima relates to adjusting ignition timing, with no teaching or suggestion of adjusting a fuel amount. Therefore, the combination fails to show or suggest all claimed limitations and ~~claim 1 should therefore be allowed. Since claims 2-4 depend~~ from claim 1, these claims should also be allowed.

#### Claims 5 and 6

As discussed above, claims 5-6 relate to adjusting the timing of injected fuel (earlier or later) that may provide for reduction in emission generation during the combustion process. As noted above, as one example, Applicants can find nothing in either Wolf et al. or Kojima that shows adjusting a fuel injection amount based on a signal derived from alterations in an acoustic wave caused by the fuel. As such, claims 5-6 should be allowed.

#### Claims 7 and 8

As discussed above, claims 7 and 8 relate to utilizing a fuel viscosity signal to generate a minimum air/fuel ratio for an engine. As one example, Applicants can find no such disclosure, teaching, or suggestion in either Wolf et al. or Kojima. As such, claims 7-8 should be allowed.

#### Claims 9 and 10

Claims 9 and 10 relate to adjusting a desired air/fuel ratio in relation to a fuel viscosity indication. As one example, Applicants can find no such disclosure, teaching, or suggestion in either Wolf et al. or Kojima. As such, claims 9-10 should be allowed.

Claim 11

Claim 11 relates to said delivered fuel in relation to a signal related to fuel viscosity. As one example, Applicants can find no such disclosure, teaching, or suggestion in either ~~Wolf et al. or Kojima. As such, claim 11 should be allowed.~~

Claim 12-13

Claim 12 claims:

A method for controlling a multi-cylinder engine operated with fuels of varying viscosity, comprising:  
generating an indication of fuel viscosity;  
delivering fuel to each of the cylinders in relation to a desired engine output; and  
adjusting said delivered fuel in relation to said fuel viscosity to maintain said desired engine output.

As one example, Applicants can find no disclosure, teaching, or suggestion in either Wolf et al. or Kojima to adjust delivered fuel in relation to said fuel viscosity to maintain a desired engine output. As such, claim 12 should be allowed. Since claim 13 depends from claim 12, it should also be allowed.

Claims 14-15

Claim 14 claims:

A method for controlling a multi-cylinder engine operated with fuels of varying viscosity, the engine inducting fuel vapors from a fuel system into an engine air intake, comprising:

generating an indication of fuel viscosity;

delivering fuel to each of the cylinders; and

adjusting said delivered fuel in relation to said inducted fuel vapors and said fuel viscosity indication.

As one example, Applicants can find no disclosure, teaching, or suggestion in either Wolf et al. or Kojima to adjust delivered fuel in relation to inducted fuel vapors and a fuel viscosity indication. Claim 14 therefore should be allowed. Since claim 15 depends from claim 14, it should also be allowed.

Claim 33

As noted above, claim 33 relates to utilizing a fuel viscosity signal to adjust fuel injection. As one example, Applicants can find no such disclosure, teaching, or suggestion in either Wolf et al. or Kojima. As such, claim 13 should be allowed.

CONCLUSION

Based on the foregoing comments, the above-identified application is believed to be in condition for allowance, and such allowance is courteously solicited. If any further amendment is necessary to advance prosecution and place this case in allowable condition, the Examiner is courteously requested to contact the undersigned by fax or telephone at the number listed below.



Please charge any cost incurred in the filing of this Amendment, along with any other costs, to Deposit Account No. 06-1510. If there are insufficient funds in this account, please charge the fees to Deposit Account No. 06-1505. A duplicate copy of this sheet is enclosed.

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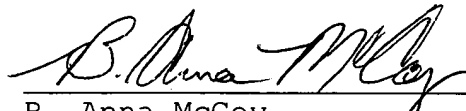
CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on May 4, 2004.

  
Lauren Barberena

Respectfully submitted,

KOLISCH HARTWELL, P.C.

  
B. Anna McCoy

Registration No. 46,077

Customer No. 36865

520 S.W. Yamhill St, Suite 200

Portland, Oregon 97204

Telephone: (503) 224-6655

Facsimile: (503) 295-6679

Attorney for Applicant